DOCUMENT RESUME

ED 426 329 CG 029 013

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TITLE Using the Internet To Enhance Test Interpretation.
PUB DATE 1998-01-18
NOTE 9p.; Plenary paper presented at the ERIC Clearinghouse on Counseling and Student Services Conference: "Assessment '98: Assessment for Change-Changes in Assessment" (St. Petersburg, FL, January 16-18, 1998).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Computer Mediated Communication; Counseling; Distance Education; *Internet; Lifelong Learning; *Test Interpretation; Test Use; Testing; Testing Problems

ABSTRACT

The Internet is now adding the potential for remote delivery of test administration, scoring, profiling, report writing, and multimedia functions, as well as cost-effective capability in communication and links to related information. Using the Internet to enhance test interpretation is the focus of this paper. A review of potential Internet applications in test interpretations is provided. One important advantage of using the Internet as a test interpretation resource is the ease with which the interpretive data can be kept current. Client preparation for test interpretation, generalized test interpretation, specific test interpretation, and supervision are covered. All of these applications can be accomplished with technology that is currently available. Computer-based test interpretation, two-way videoconferencing, moderated list servers, moderated computer conference, and follow-up resource links are potentially powerful features of the Internet available to test users. Issues discussed associated with Internet use in test interpretation include inappropriate use of counselor-mediated assessment, relationship issues, ethical issues, credentialing, and counselor training. Given the general direction of change, it would seem wise to experiment with appropriate applications of this technology and proactively deal with potential limitations while there is still time to shape the early adoption of the Internet in testing. (EMK)

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by
James P. Sampson, Jr.

Plenary paper presented at the
Assessment '98 Conference: Assessment for Change--Changes in Assessment,
St. Petersburg, Florida, January 18, 1998

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Using The Internet to Enhance Test Interpretation

Computer applications in assessment have been in use for over forty years. Main frame computers made it cost-effective to score, profile, and produce narrative interpretive reports for traditional paper-and-pencil tests. Personal computers subsequently made it cost-effective to add test administration and multimedia elements to the above functions. The Internet is now adding the potential for remote delivery of test administration, scoring, profiling, report writing, and multimedia functions, as well as adding potential cost-effective capability in communication and links to related information.

Principles of effective and responsible test use are embodied in testing standards (AERA, APA, NCME, 1985; Joint Committee on Testing Practices, 1988; & AMECD, 1989) and assessment competency statements (Garfield & Prediger, 1994). These standards and competency statements refer to common elements of the assessment process that include test selection, administration, scoring and interpretation, as well as communicating effectively with test takers and parents or guardians in the case of minors. In practice, these testing elements can be sequenced as follows:

- selection
- orientation
- administration
- scoring
- interpretation

The focus of this particular paper will be on using the Internet to enhance test interpretation. The paper begins with a review of potential Internet applications in test interpretation and concludes with issues associated with Internet use in test interpretation.

Internet Applications in Test Interpretation

One important potential advantage of using the Internet as a test interpretation resource is the ease with which the interpretive data can be kept current. The costs associated with disk manufacture, shipping, and billing, makes it expensive for publishers to update interpretive software as each new enhancement is available from on-going practice and research. As a result, test publishers tend to wait until considerable knowledge or software enhancements accumulate before releasing a new version of the interpretive software. With the Internet, test publishers can update software as the information becomes available, notifying users of recent changes as they access a password-protected site, and bill on a per use basis or on an annual license basis.

The Internet can be used in a variety of ways to potentially enhance test interpretation. This section will deal with client preparation for test interpretation, generalized test interpretation, specific test interpretation, and supervision. All of the following applications can be accomplished with technology that is currently available.

Client Preparation for Test Interpretation

Effective test interpretation actually begins before a test is administered. Orientation to testing provides a foundation for delivering a subsequent test interpretation. Problems in test interpretation can often be prevented if clients (and their parents or guardians, if appropriate) are adequately informed of the purpose and process of testing. For example, the common client perception that the "scientific" nature of testing will provide an "answer" to his or her problem can potentially be altered by information delivered during orientation. Intelligent counselors, however, frequently become bored with repetitive tasks and as a result are attracted to more intellectually challenging and interesting tasks. The problem is that test orientation often involves presenting repetitive information. Since computers do not become bored with repetitive information delivery, they are likely to be a more effective learning resource for general principles of test orientation. Years of experience in delivering computer-assisted instruction could be easily applied to the task of test orientation on the Internet. Using a password to maintain security, clients could access the orientation at their convenience at home or at public locations, such as a public library. The counselor would add any necessary client-specific orientation that is not covered by computer-assisted instruction.

Generalized Test Interpretation

Similar to test orientation, test interpretation can also often be repetitive and time consuming for the counselor. As a result, counselor performance can be compromised.

Two negative outcomes may result for the client. First, the client may not receive information they need regarding basic terminology used in a particular test and what is being measured by scale and total scores. This lack of basic knowledge may make it more difficult for the client to understand and apply the more specific interpretive information provided by the counselor. Second, if the counselor appears bored while delivering basic information, the client may misperceive that the counselor is bored with him or her and the counseling relationship may be harmed as a result. Even if the counselor does a good job of communicating basic concepts, less time is available to help a client gain insights about factors that influence his or her behavior and to help integrate insights gained in assessment into a realistic plan for behavior change. Using a computer to provide a generalized test interpretation of test results can help a client to be better prepared for a specific test interpretation by "being aware of basic terminology, concepts, and the general nature of their scores" (Sampson, 1983, p. 294). By allocating the repetitive computational and instructional tasks to the computer, the counselor can focus on interpersonal functions associated with helping clients understand and apply test results to their individual circumstances (Sampson, in press-a).

Specific Test Interpretation

Building on the foundation of the generalized test interpretation, specific test interpretation adds interpretation of individual scales and aggregate score profiles as well as recommendations for action based on test results. In the case of self-assessment instruments, such as the Self-Directed Search (SDS, Holland, 1994), the measures are designed to be administered and interpreted without input from a counselor. As a result, self-assessment instruments may be delivered on the Internet by using or adapting existing personal computer-based interpretations, such as the interpretation for the Self-Directed Search (Reardon & PAR Staff, 1996). Although self-assessment instruments can be used without counselor input, Reardon and Lenz (in press) noted that experience with the SDS has shown that counselor input enhances the effectiveness of interpretations. In the case of counselor-mediated (traditional) assessment, the measures require that trained practitioners deliver test interpretations to clients. This section will deal with computer-based test interpretation, two-way videoconferencing, moderated list servers, computer moderated conferences for group interpretation, and follow-up resource links.

Computer-based test interpretation. Computer-Based Test Interpretation (CBTI) can enhance the validity and reliability of testing by providing counselors with an expanded and consistent knowledge base for test interpretation. Accumulated research data and practitioner experience expands the knowledge base for interpretation, while the standardized nature of computing contributes to the consistency of interpretation. In comparison with practitioner-developed reports, CBTI reports tend to be more comprehensive and objective and less subject to interpreter bias (Sampson, in press-a). Varying types of CBTI exist according to the type of knowledge base that is used for the software. CBTI can be categorized as descriptive, clinician-modeled (renowned clinician type), clinician-modeled (statistical model type), and clinical actuarial (Roid & Gorsuch, 1984). CBTI has also been categorized into three levels: (a) the statement level contains data-based descriptions; (b) the narrative level adds the judgment of experts in sequencing interpretive statements; and (c) the decision level adds prediction of client behavior (Lanyon, 1987).

Computer-based test interpretation via the Internet can be used in three different modes. When using self-assessment instruments, clients can independently access CBTI from password-protected Internet sites immediately after test administration is complete. Given that the Self-Directed Search (SDS, Holland, 1994) was designed to be used with little or no counselor intervention (Reardon & Lenz, in press), the SDS could be administered and interpreted over the Internet. In this case generalized and specific test interpretation are combined for the user. When using counselor-mediated assessment, the client first reviews a generalized test interpretation, then discusses his or her results with a counselor (face-to-face or using a videoconference over the Internet), and then reviews a specific test interpretation delivered from a password-protected Internet site as a homework assignment. Some counselors might prefer for clients to review both

the generalized and the specific interpretation as preparation for counseling. In one case, the specific interpretation on the Internet reinforces learning that occurs in counseling, while in the second case, specific interpretation serves as an advance organizer for subsequent learning occurring in counseling. The current narrative interpretive report for the Strong Interest Inventory (SII, Hansen, Harmon, Borgen, & Hammer, 1994) could be delivered over the Internet in this manner. The third mode for delivering CBTI occurs when the principal consumer of test data and reports is the counselor, rather than the client. In this case, no generalized interpretation is provided to the client, and the counselor accesses a specific interpretation from a password-protected Internet site. For, example, the current narrative interpretive report for the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, Hathaway, & McKinlay, 1989) could be delivered over the Internet in this manner.

By integrating CBTI, multimedia, and the Internet, it will be possible to better attend to multicultural issues in test interpretation. The gender, age, race, and ethnicity of the individual visually presenting information on test interpretation can be made to match the group membership of the test taker. Keeping group membership constant should make it easier for the client to relate to and understand the individual presenting the interpretation (Sampson, 1990). Additional multicultural research on test content and test interpretation can be added to CBTI as the research becomes available.

Much of the current Internet is text intensive, data intensive, and structured. These characteristics make it more difficult for the many individuals with limited literacy skills to access and successfully use the Internet. Integrating CBTI and multimedia can make it easier for individuals with limited literacy skills to use the Internet. Providing versions of test interpretations with more video content and less text has the potential to help both individuals with limited literacy and individuals with a more visual learning style.

Two-way videoconferencing. Presentation and discussion of test interpretations could be accomplished via two-way videoconferencing over the Internet. This use of technology may be especially appropriate for clients in geographically remote locations and clients with physical disabilities who could choose to receive services at their residence. E-mail could be used to schedule test interpretation sessions. Documentation of the completion of a test interpretation, including all test reports and intervention (treatment) plans, could be automatically added to the client's case notes. Subsequent client questions or concerns could be E-mailed to the counselor for immediate response or discussion at the next scheduled counseling session (Sampson, Kolodinsky, & Greeno, 1997).

Delivering CBTI via two-way videoconferencing could be an option that individuals might select who have completed self-assessment measures. CBTI for self-assessment could indicate the availability and potential benefits of two-way videoconferencing with a counselor trained in interpreting this specific test. Individuals selecting this option could either pay for the time used (as is the case for many current telephone help lines for computer software) or the service could be paid for by an organization with a mission to serve specific populations (such as employment service staff helping individuals make the transition from welfare to work). Self-assessment measures are increasingly being incorporated into comprehensive counseling resources, such as computer-assisted career guidance systems. Two-way videoconferencing makes it possible for the counselor to intervene "in the moment," providing access to client perceptions and behavior as they occur, instead of subsequently discussing a client's reconstruction of a learning event that has occurred in the past (Sampson et al., 1997).

Moderated list servers. Moderated mailing lists assist individuals with common interests to communicate with each other (Offer & Watts, 1997). A list server allows sequential public exchange of text-based information on a predetermined topic among a predetermined group of individuals (Sampson et al., 1997). Messages are distributed to all individuals who have registered to participate on the list server. The lack of interaction in "real time" is offset by the convenience of being able to view messages at any time. The participant can choose to post

messages or to simply read the available messages and maintain a degree of anonymity. The moderator is responsible for keeping the interaction focused, halting inappropriate information exchanges, and proactively dealing with potential ethical problems. This resource would allow a counselor to respond to general questions about test interpretation or specific questions about individual test results (assuming that informed consent has been given when joining the list server). Participants can potentially learn from the interpretive insights revealed by the counselor and other members of the list server. The list server can also provide some social support for confronting issues revealed in test results and in taking action for positive behavior change.

Moderated computer conferences. A moderated computer conference allows simultaneous public interaction among a predetermined group of individuals (Sampson et al., 1997). The requirement of adhering to a scheduled time for interaction is offset by the higher level of interpersonal interaction that is possible in "real time." While not identical, the group dynamics associated with group counseling are also operative in computer conferences. As a result, the availability of a moderator can help keep the interaction among participants focused, ensure that all participants have the opportunity to contribute, halt inappropriate information exchanges, and proactively deal with potential ethical problems. A moderated computer conference can serve the same functions as the moderated list server described above with the exception that the "real time" interaction available has the potential to provide the opportunity to more quickly explore issues in greater depth and to provide a higher level of social support.

Follow-up resource links. A potentially powerful feature of the Internet is the ability to use links embedded in one Internet web site to access related information and services available at other Internet web sites. Links can be used to promote additional learning related to test interpretation. For example, an interest inventory interpretation could reveal links to occupational information web sites for a client's high scoring occupations as a stimulus for career exploration. The interpretation of a measure of study skill behaviors could reveal links to web sites delivering specific study skills instruction.

Supervision of Test Interpretation

The Internet has expanded opportunities for delivering supervision, potentially enhancing both the quantity and quality of interaction (Casey, Bloom, & Moan, 1994). The Internet can be used to facilitate supervision in several ways. A moderated list server could be used as a form of group supervision, with counselors requesting assistance for difficult interpretive issues. The moderator could be selected on the basis of specific interpretive expertise as well as his or her group facilitative skills. In this case, the role of the moderator would be expanded to include sharing his or her interpretive expertise and ensuring that the contributions of the other participants are appropriate for a specific test. Two-way videoconferencing could also be used for individual supervision. The client's case notes (Casey et al., 1994), test results, and CBTI report could be attached to an e-mail file and sent to the supervisor to help with preparation for supervision. The supervisor and supervisee could then discuss a specific test interpretation in depth from remote locations in "real time." A variation might include adding a consultant from a remote location to an ongoing supervisory relationship when an unusual interpretive question requires highly specialized expertise.

Issues Associated with Internet Use in Test Interpretation

While the Internet applications described above offer the potential to enhance the access to and the quality of testing, issues also exist that have the potential to nullify the potential benefits of using this technology. This section deals with inappropriate use of counselor-mediated assessment, relationship issues, ethics, credentialing, and counselor training.

Inappropriate use of Counselor-Mediated Assessment

As stated previously, counselor-mediated (traditional) assessment is designed to include trained practitioners in delivering test interpretations to clients, while self-assessment measures are designed to be self-interpreting. The problem occurs when counselor-mediated measures are delivered on the Internet without practitioner intervention. The first problem is the

assumption that the results of the Internet-delivered version are equivalent in validity to the results of the traditional measure. The second problem is the assumption that the written interpretation offered on the Internet is equivalent in validity to the interpretation offered by a practitioner. Moving the interpretation of a self-assessment measure to the Internet is appropriate if the measure was originally validated to be self-interpreting. Unless validation data are available, the interpretation of counselor-mediated measures on the Internet without practitioner intervention is inappropriate (NCDA, 1997).

Relationship Issues

Videoconferencing and face-to-face interaction have been shown to be similar, but not identical forms of communication. Videoconferencing resulted in a more intense task focus and greater participant awareness of their physical appearance in the visual recording process, in comparison with face-to-face interactions (Oravec, 1996). The question, "Is remote videoconference interaction between a counselor and a client in a helping relationship equivalent to face-to-face interaction?" is an interesting, but not crucial question. Given our current knowledge, the ultimate answer will likely be no—videoconferencing and face-to-face interaction are different forms of communication. The more important question is, "Does remote videoconference interaction between a counselor and a client in a helping relationship assist clients in understanding and applying test results to solving problems and changing behavior?" Development of initial Internet applications and subsequent research on effectiveness is necessary to maximize the benefits and minimize the limitations associated with using this technology in counseling (Sampson, in press-b).

Ethical Issues

Numerous ethical issues have been raised related to delivering assessment, information and counseling over the Internet (Bartram, 1997; Sampson, in press-b; Sampson et al., 1997). The confidentiality of client data transmission and storage of assessment data can be compromised. It is possible to deliver interpretive information on the Internet that is attractively presented but inherently invalid. There may be a lack of counselor intervention for clients who need a more personalized level of assistance. Inadequately trained or overworked counselors may misuse or become dependent on software, such as CBTI. A lack of counselor awareness of important location-specific circumstances may cause a counselor in a remote location to misinterpret client data or fail to recognize relevant issues. Clients with limited financial resources may have difficulty gaining access to the Internet. Finally, accessing the Internet from a residence shared with other individuals may not provide the auditory and visual privacy necessary for the client to establish and maintain a counseling relationship.

Initial issues associated with computer networking were addressed in ethical standards and practice guidelines adopted in the American Association for Counseling and Development (1988), the National Board for Certified Counselors (1989), the National Career Development Association (1991), and the American Psychological Association (1986). These initial standards on computer networking have recently been revised and expanded to deal specifically with the provision of information and counseling services over the Internet.

The NBCC/CCE (1997) webcounseling standards address links to existing standards, confidentiality, supervision, relationship issues, release of information, record keeping, self-disclosure, certification and licensure, research, informed consent, impostor clients and counselors, security, local counseling support, liability, counselor access off-line, inappropriate presenting concerns, assessment and intake, communication problems, and relationship issues. The NCDA (1997) Internet standards specifically deal with the qualifications of the developer or provider, access to Internet sites, counselor understanding of local environment, content of career counseling and planning services, appropriateness of the client for receipt of services, appropriate local support for the client, clarity of the contract with the client, inclusion of linkages to other web sites, use of assessment, job posting and searching, and unacceptable counselor behaviors.

Credentialing

The Internet poses some important challenges regarding credentialing. At present, it is uncertain how state counselor licensure laws

will apply to a counselor delivering information and services out-of-state (Sampson et al., 1997). The same issue applies to delivering interpretive information and services across national boundaries (Bartram, 1997). Also, counselors delivering interpretive information and services over the Internet need to clearly indicate their credentials, including the complete name of the credential, as well as the name and address of the credentialing organization. Existing Internet web sites often fail to indicate the credentials of the service provider (Sampson et al., 1997). The potential lack of client awareness of the role of credentialing in protecting the public encourages unqualified persons to offer assessment information and services.

Counselor Training

Preservice and inservice counselor training is essential if counselors are to use the Internet effectively to serve their clients. Students graduating from counselor preparation programs, as well as experienced counselors, need to be competent in using Internet search engines, familiar with current web sites related to counseling, skilled in evaluating the quality of web sites, competent in integrating counseling interventions with Internet use, knowledgeable of the process for implementing Internet applications into counseling services, and aware of ethical issues and related professional standards. Students-in-training and practicing counselors who wish to take leadership in developing Internet applications need to supplement the above preparation with instructional design competencies and web site design skills.

Conclusion

While the move to a paperless society has been less rapid than some futurists predicted, there appears to be inexorable movement in the direction of increased Internet use. Several factors are encouraging this trend. First, the cost-effectiveness of computer technology continues to improve dramatically. Second, internet applications in general are growing exponentially despite the fact that the majority of Americans still do not have Internet access at home. Third, the pressure for distance learning will continue as the life-long demand for education and training increases and funding remains limited. Appropriate distance learning choices will increasingly be made on the basis of distance guidance, and testing will likely continue to play an important role in the guidance function. The speed at which these changes will occur can be debated, but the general direction of the change seems clear. It would seem wise to carefully experiment with appropriate applications of this technology and to proactively deal with potential limitations while there is still time to shape the early adoption of the Internet in testing.

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